

PATENT

Attorney Docket No. A-70723-1/TAL/VEJ  
Attorney Matter No. 469120-00049  
Application No. 10/750,452***In the Claims:***

This listing of claims will replace all prior versions, and listings, of claims in the application.

1-13. (Cancelled, without prejudice or disclaimer)

14. (Original) A system enabling a user-manipulated user-object used with a virtual transfer device to transfer information to a companion device, the system comprising:

a central processor unit including memory storing at least one software routine;

a first optical system defining a plane substantially parallel-to and spaced-above a presumed location of said virtual transfer device;

a second optical system having a relevant field of view encompassing at least portions of said plane and responsive to user-object penetration of said plane to interact with said virtual transfer device;

means for determining relative position of a portion of said user-object on said plane;

wherein said system transfers information to said companion device enabling user-object with said virtual transfer device to affect operation of said companion device.

15. (Original) The system of claim 14, wherein said means for determining includes determining said relative position using triangulation analysis.

16. (Original) The system of claim 14, wherein said means for determining includes said processor unit executing said routine to determine said relative position.

17. (Original) The system of claim 14, wherein:

said first optical system includes means for generating a plane of optical energy; and

said second optical system includes a camera sensor that detects a reflected portion of said optical energy when said user-object penetrates said plane.

PATENT

Attorney Docket No. A-70723-1/TAL/VEJ  
Attorney Matter No. 469120-00049  
Application No. 10/750,452

18. (Original) The system of claim 14, wherein:

    said first optical system includes at least one of (i) a laser to generate said plane, and (ii) an LED to generate said plane; and

    said second optical system includes a camera sensor that detects a reflected portion of said optical energy when said user-object penetrates said plane.

19. (Original) The system of claim 14, further including means for enhancing responsiveness of said second optical system to said user-object penetration while decreasing said responsiveness to ambient light.

20. (Original) The system of claim 19, wherein said means for enhancing includes at least one of (a) providing a signature associated with generation of said plane, (b) selecting a common wavelength for energy within said plane defined by said first optical system and for responsiveness of said second optical system, and (c) synchronizing operation of said first optical system and operation of said second optical system.

21. (Original) The system of claim 14, wherein said first optical system includes a first camera sensor that defines said plane.

22. (Original) The system of claim 14, wherein:

    said first optical system includes a first camera sensor that defines said plane;

    said second optical system includes a second camera to sense said penetration;

    and further including:

    a source of optical energy directed generally toward said virtual transfer device; and

    means for synchronizing operation of at least two of same first optical system, said second optical system, and said source of optical energy;

    wherein effects of ambient light upon accuracy of information obtained with said system are reduced.

PATENT

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Application No. 10/750,452

23. (Original) The system of claim 14, wherein:  
said first optical system includes a generator of optical energy of a desired wavelength;  
and  
said second optical system is sensitive substantially only to optical energy of said desired wavelength.

24. (Original) The system of claim 14, wherein said companion device includes at least one of (i) a PDA, (ii) a portable communication device, (iii) an electronic device, (iv) an electronic game device, and (v) a musical instrument, and said virtual transfer device is at least one of (I) a virtual keyboard, (II) a virtual mouse, (III) a virtual trackball, (IV) a virtual pen, (V) a virtual trackpad, and (VI) a user-interface selector.

25. (Original) The system of claim 14, wherein said virtual transfer device is mapped to a work surface selected from at least one of (i) a table top, (ii) a desk top, (iii) a wall, (iv) a point-of-sale appliance, (v) a point-of-service appliance, (vi) a kiosk, (vii) a surface in a vehicle, (viii) a projected display, (ix) a physical display, (x) a CRT, and (xi) an LCD.

26. (Original) The system of claim 14, wherein at least one of said first operating system and said second operating system is a camera sensor having a lens and an image plane;  
wherein at least one of said lens and said image plane is tilted to enhance at least one of resolution and depth of field.

27. (Original) The system of claim 14, further including means for enhancing distinction of said user-object from a background object.